

Remarks/Arguments

Claims 1-19 remain in this application. Claims 10-19 have been withdrawn.

The examiner has rejected claims 1-3 under 35 USC 102(b) as being anticipated by *Lipkin, et al.* (United States Patent 6,437,371).

The examiner has objected to claim 3 as being substantially duplicate of claim 2.

The examiner has rejected claim 4 under 35 USC 103(a) as being unpatentable over *Lipkin, et al.* in view of admitted prior art.

The examiner has rejected claims 5-7 under 35 USC 103(a) as being unpatentable over *Lipkin, et al.* in view of *Tihanyi, et al.* (United States Patent 6,365,919).

The examiner has allowed claims 8 and 9.

In view of the above amendments and these remarks, reconsideration of the above noted rejections and objections is respectfully requested.

Claim Objection:

Claim 3 calls for "a crystalline **carbon** film;" whereas, **claim 2** calls for "a crystalline **carbon-containing** film." **Claim 3** is thus narrower than **claim 2**, since a "carbon-containing" derivative may or may not contain other materials; whereas, straightforward "carbon" specifically does not. This distinction is supported in the Specification at page 8, lines 3-6, and throughout. Applicant respectfully submits, therefore, that **claim 3** is not substantially duplicate of **claim 2**, since **claim 3** is more narrowly drawn than **claim 2**.

Rejections under 35 USC 102(b):

Applicant respectfully traverses the rejection of **claims 1-3** under 35 USC 102(b) as being anticipated by *Lipkin, et al.* **Claim 1** is independent and **claims 2 and 3** depend from **claim 1**.

Independent **claim 1** recites:

providing a silicon carbide base;
epitaxially growing a dielectric film on the silicon carbide
base.

Applicant respectfully submits that *Lipkin, et al.* does not teach or suggest these limitations. Instead, *Lipkin, et al.* appears to disclose variations on a concept in which a dielectric film is deposited on a silicon carbide layer, but without epitaxially growing the dielectric film. For instance, Fig. 1 of *Lipkin, et al.* discloses a layer of silicon carbide 11 on which a layer of silicon dioxide 12 is formed. (Column 3, lines 57-59; Column 4, lines 6-7.) Then a layer 13 of another insulating material is formed on the silicon dioxide layer 12. (Column 4, lines 14-15.) The layer 13 may be barium strontium titanate (BST). (Column 4, lines 16-23.) The office action notes that BST is a perovskite oxide, meaning that it is a single crystal. As such, the office action implies that the BST may be epitaxially grown. *Lipkin, et al.*, however, discloses only that the layer 13 may be formed by chemical vapor deposition (CVD), plasma-enhanced CVD (PECVD) or sputter-depositing a metal and then oxidizing it. (Column 4, lines 42-47.)

Similar to Fig. 1, Fig. 2 of *Lipkin, et al.* discloses a layer of silicon carbide 16, a layer of silicon dioxide 17 formed on the layer of silicon carbide 16 and a layer of the insulating material 20 (similar to the layer 13, above) formed on the layer of silicon dioxide 17. (Column 4, lines 30-35.) Again, *Lipkin, et al.* discloses only that the layer 20 may be formed by CVD, PECVD or sputter-depositing a metal and then oxidizing it. (Column 4, lines 42-47.) Similar to Figs. 1 and 2, Fig. 3 of *Lipkin, et al.* discloses a silicon carbide portion 25, a layer of silicon dioxide 27 formed on the silicon carbide portion 25 and a layer of the insulating material 30 (similar to the layers 13 and 20, above) formed on the layer of silicon dioxide 27. (Column 5, lines 5-15.) Similar to Figs. 1-3, Fig. 4 of *Lipkin, et al.* discloses a silicon carbide portion 41, a layer of silicon dioxide 42 formed on the silicon carbide portion 41 and a layer of the insulating material 43 (similar to the layers 13, 20 and 30, above) formed on the layer of silicon dioxide 42. (Column 5, lines 35-40.) Similar to Figs. 1-4, Fig. 8 of

Lipkin, et al. discloses a silicon carbide layer 63 on top of which is a first silicon dioxide layer 71, a silicon nitride layer 72 (potentially similar to the layers 13, 20, 30 and 43, above), and a second silicon dioxide layer 73. The silicon carbide layer 63 is on top of an n+ drain region 64, which is on top of a drain contact 65. (Column 6, lines 29-39.) The region 64 is not disclosed as silicon carbide, and the layer 63 on top of region 64 is not a dielectric. And in each of these cases, the layer (potentially BST) 13, 20, 30, 43 or 72 is not formed on the silicon carbide portion 11, 16, 25, 41 or 63, as recited in **claim 1**, but on the intervening silicon dioxide layer 12, 17, 27, 42 or 71.

Applicant respectfully submits, therefore, that independent **claim 1** is not anticipated by, is not obvious in view of, and is patentable over *Lipkin, et al.* at least because the reference does not teach or fairly suggest that a dielectric film is epitaxially grown on a silicon carbide base. Likewise, since **claims 2 and 3** depend from claim 1, these claims also are not anticipated by, are not obvious in view of, and are patentable over *Lipkin, et al.* at least because of the same reasons.

In addition to the above, **claim 2** recites:

the step of epitaxially growing the dielectric film further comprises forming a **crystalline carbon-containing film** on the silicon carbide base.

And **claim 3** recites:

the step of epitaxially growing the dielectric film further comprises forming a **crystalline carbon film** on the silicon carbide base.

Applicant respectfully submits that *Lipkin, et al.* does not teach or suggest these limitations. Instead, *Lipkin, et al.* appears to disclose that the layer formed on the silicon carbide layer 11, 16, 25, 41 or 63 is a silicon dioxide layer 12, 17, 27, 42 or 71 in every case. Additionally, the layer 64 (described in the office action as equating with the claimed silicon carbide base) is not disclosed in *Lipkin, et al.* as silicon carbide, and the layer 63 formed on the layer 64 is not a dielectric film. In addition to the above arguments, Applicant respectfully submits, therefore, that dependent **claims 2 and 3** are not anticipated by, are not obvious in view of, and are patentable

over *Lipkin, et al.*, at least because the reference does not teach or fairly suggest that epitaxially growing a dielectric film on a silicon carbide base involves forming a crystalline carbon or carbon-containing film.

Rejections under 35 USC 103(a):

Applicant respectfully traverses the rejection of **claim 4** under 35 USC 103(a) as being unpatentable over *Lipkin, et al.* in view of admitted prior art and the rejection of **claims 5-7** under 35 USC 103(a) as being unpatentable over *Lipkin, et al.* in view of *Tihanyi, et al.* **Claims 4-7** depend directly or indirectly from **claim 1**. As explained above, independent **claim 1** is not anticipated by, is not obvious in view of, and is patentable over *Lipkin, et al.* *Tihanyi, et al.* does not cure the deficiencies in *Lipkin, et al.* at least because *Tihanyi, et al.* does not teach or fairly suggest that a dielectric film is epitaxially grown on a silicon carbide base. (The dielectric in *Tihanyi, et al.* is the insulating layer 8, which is formed by thermal oxidation, not epitaxial growth. See Column 3, lines 3-5.) Therefore, since **claims 4-7** depend from claim 1, these claims are not anticipated by, are not obvious in view of, and are patentable over *Lipkin, et al.* in view of *Tihanyi, et al.* at least because of the same reasons.

Allowable Subject Matter:

Applicant respectfully thanks the Examiner for indicating that **claims 8 and 9** are allowed.

For the reasons specifically discussed above, and others, it is believed that **claims 1-9** define patentable subject matter. Reconsideration of the previous rejections and objections as they might apply to the pending claims is therefore

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respectfully requested. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Respectfully submitted,



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